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The Exploration of ESP and Human Personality[1]

J. FRASER NICOL AND BETTY M. HUMPHREY

We have indications of something complex and obscure in the structure of human personality, of something transcending sensory experience in the reserves of human faculty.

FREDERIC W. H. MYERS

Thus wrote the distinguished author of *Human Personality* more than half a century ago. In the intervening years our whole conception of human personality in psychical research has undergone extensive modification, a change due to the intensive analysis of personality carried out and studied by experimental psychologists. Close on twenty years ago the results of those psychological discoveries began to be applied to the problems of psychical research, and at this date more than thirty papers have been written on the relationships existing between personality characteristics and extrasensory perception.

[1] The collection of the data of this report was carried out when we were associated with the Parapsychology Laboratory, Duke University, and was in part supported by the Rockefeller Foundation. The extensive program of analysis and study of these data was made possible by a grant from the American Society for Psychical Research. For their interest and encouragement we are especially grateful to Mrs. E. W. Allison, Dr. Gardner Murphy, Dr. George H. Hyslop, and Mrs. L. A. Dale.

Previous investigations have been primarily concerned with intensive study of limited aspects of personality. One of the most striking facts about such work is that it rarely meets with failure, an impressive commentary on the contrast between it and the general run of failure in simple card-guessing experiments.

The purpose of the research reported in this paper was to extend the investigation over a wider range of personality assessment than had hitherto been employed. In this first stage of what was planned as a prolonged series of researches, we proposed to explore the field by studying the ESP scores of 50 subjects and those subjects' scores on some dozen or more factors of personality. From this exploration we hoped to get information that would lead our steps into the most promising lines of advance for future and more intensive research.

Personality has been investigated by a variety of methods. Some of these have been successfully applied to the problems of psychical research. In projective tests the subject is presented with unstructured material such as incomplete sentences, unfinished pictures, or inkblots which he has to interpret or complete. It has been found that with such material the subject reads into it the feelings and experiences of his own personality. The Rorschach Ink Blot Test has been used by Schmeidler to discriminate between well-adjusted and poorly-adjusted percipients in ESP tests (12), and her work has been remarkably revealing. Humphrey has used the Elkisch drawing technique to separate expansive from compressive subjects in ESP experiments (7). Projective methods are extremely valuable for the intensive study of the relationship of ESP to certain aspects of personality. One disadvantage is the amount of time required to administer and evaluate the best projective tests. Moreover, most projective techniques are in an uncertain status with regard to standardization and validation, and do not yield numerical values for easy comparison with ESP scores. In the present inquiry, therefore, we have concentrated on the simpler "paper-and-pencil" questionnaires for personality assessment.

The questionnaire method which we adopted has been successfully used by psychologists in the educational, commercial, military, and clinical fields for a long period of years. It has also proved an effective method of studying the personality relationships of ESP, as is shown by the work of Stuart, Burke Smith, and Humphrey. In this technique the subject is presented with printed lists of questions dealing with common experiences, which if truthfully answered, will describe his "adjustments to his environment." In some cases a single

questionnaire will cover half a dozen or more factors of personality. The questions are haphazardly arranged, and the answers are afterwards sorted out into the different personality factors by the experimenters.

The limitation of the method rests of course on the the fact that the subject is required to give his own account of himself. An objective view of oneself is difficult to attain, but it is a reassuring feature of some of the newer personality questionnaires that the questions are so phrased that little more is required from the subject than straightforward sincerity.

We believe that the measures obtained in the present research may be accepted as reasonably trustworthy for three reasons: (1) all subjects were volunteers, (2) they were assured that their answers would be confidential, and (3) they were told that complete candor was necessary to obtain valid correlations with ESP.

Three main questionnaires were used: one devised by Guilford, testing five factors of personality; one by Guilford and Martin testing five further factors; and one by Cattell which embraces sixteen personality factors. Both Guilford's and Guilford and Martin's inventories have been used in psychological research for some years and their validity and reliability are known. Cattell's Sixteen Personality Factor Questionnaire is new and is undergoing further standardization. Nevertheless, since it purports to cover such a wide range of characteristics, we thought it worth a trial.

For the ESP side of this study, we confined our interest to clairvoyance tests because they are simpler to administer and allow closer association of experimenters and subjects. Two types of clairvoyance test were alternated for each subject: (1) "Unknown" tests, or the standard ESP test, where the subject is informed of his success or failure only at the end of each test, and (2) "Known" tests, in which the subject is shown the actual target card after each guess, therefore allowing him immediate knowledge of his success or failure on each trial. Subjects' scores on both types of ESP test were afterwards correlated with their scores on various personality factors in order to judge which of these factors were important in the functioning of ESP.

As it turned out, the research yielded more interesting and varied results than we had expected. We shall concentrate in this report on the relation of the personality scores to the two ESP tests and to their total; other aspects of the research will be described in a later report.

The Plan of the Experiment

Technical Details

ESP Test. Each subject called 16 packs of ESP cards, each pack containing 25 cards. The 16 packs were used in two different types of clairvoyance test:[2]

(1) "Unknown" runs, the usual ESP test procedure in which the subject called all 25 cards before being told of his success or failure.

(2) "Known" runs, a procedure in which the subject was shown each target card as soon as he had called it; thus he knew immediately after each guess whether he was right or wrong.

Unknown runs were alternated with Known runs through the 16 packs for each subject. Odd-numbered subjects began their tests with an Unknown run, followed by a Known run, and so on through the session. The reverse procedure was used for even-numbered subjects, the session beginning with a Known run for them.

The authors, as experimenters, were present at every session. One recorded the subject's choices while the other handled the cards behind a screen. For half of the subjects the session began with JFN handling the cards for eight packs, while BMH recorded for the subject. After eight packs, the experimenters changed places, BMH holding the cards and JFN recording the subject's calls. For the other half of the subjects, BMH handled the cards for the first eight runs, and JFN took over this role for the last eight runs.

Before the experiment began, the order of procedures was worked out in such a way that Unknown and Known runs came at the beginning of the session an equal number of times, and JFN and BMH handled the cards for each half of the session an equal number of times. In effect then, four different arrangements of the procedures were followed in this order:

(1) JFN handled cards first 8 runs; BMH handled them second 8 runs; order of runs: Unknown, Known, Unknown, Known, etc.

(2) BMH handled cards first 8 runs; JFN handled them second 8 runs; order of runs: Known, Unknown, Known, Unknown, etc.

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[2] We have described these experiments as a test of clairvoyance because the experimenter did not look at the cards during a run. The experimenter handling the cards, however, *might* have derived knowledge of the symbols by use of the sense of touch or by unconsciously reading the impressions of the symbols that can sometimes be dimly discerned on the backs of such cards under suitable lighting conditions. Neither experimenter was ever aware of such experience, but if unconscious knowledge cannot altogether be ruled out it would evidently be more apt to describe the experiments by some wider term as "general extrasensory perception." With this qualification in mind, we shall continue to use, for convenience, the term "clairvoyance."

(3) BMH handled cards first 8 runs; JFN handled them second 8 runs; order of runs: Unknown, Known, Unknown, Known, etc.

(4) JFN handled cards first 8 runs; BMH handled them second 8 runs; order of runs: Known, Unknown, Known, Unknown, etc.

Since in some runs the subjects were to see the cards after each trial, the packs had to be made up in such a way that the subjects could not infer the order of the cards after seeing a part of the pack. Complete randomization of the entire series of cards (14,400) meets this situation successfully. The cards were randomized from Kendall and Smith's tables of random numbers (8). The random numbers in the tables were translated into ESP symbols according to a set code and the symbols were written on ESP record sheets. Symbols sufficient for 200 packs were recorded at a time, and a duplicate copy of the symbol orders was also made. Packs of cards were then made up to match the symbol lists. The sheets containing the carbon copy of the symbol order were cut up into slips so that a slip showing the order for each pack could be attached to the pack. Each pack of cards and the record of its order were placed in a card box and the boxes numbered consecutively for use in the experiment. The original list of the card orders was retained by a colleague who was not connected with the experiment.

The first batch of 200 packs was made up entirely by a colleague, but the task was so laborious and time consuming for one person that a different plan was followed for subsequent batches of cards: BMH and JFN translated the random numbers into ESP symbols and made up the packs to match the symbol lists. A colleague then took the packs and the two copies of the card order, assigned random numbers (from Kendall and Smith's tables) to the 200 packs and so rearranged them that in a test BMH and JFN would not know what pack they were using until they came to the checking of the scores. The assistant placed the cards in boxes, attached one copy of the card order to each pack, and retained the original card orders. In all, 800 packs of cards were made up, but only 576 were used in this experiment. The original lists of card orders are still in the possession of a colleague.[3]

When a batch of 200 packs was prepared, the cards were locked in a desk drawer in JFN's office, a room not used in testing the subjects. Just prior to the ESP test the 16 packs to be used were transferred to a locked drawer in BMH's desk in the experimental room. At no time did a subject have access to the prepared cards. Each pack was used only once.

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[3] With full knowledge of the exacting task to which we subjected those who aided us in preparing the cards, we wish to thank Miss Elizabeth McMahan, Mrs. Esther Foster, and Miss Louise F. Nicol for their help.

The Experimental Room. All tests were carried out in BMH's office, a room approximately 20 feet long and 13 feet wide. The subject sat in a large low easychair at one end of the room. To his right was a small table upon which were displayed one of each of the five ESP symbols (circle, cross, square, star, waves) as a reminder to the subject of his possible choices. Nearby, with his back to the subject sat the experimenter who recorded the subject's calls (E1). (The positions of the subject, S, and the two experimenters, E1 and E2, are shown in the rough diagram of the experimental room, Figure 1.) Directly in front of the subject and approximately ten feet away,

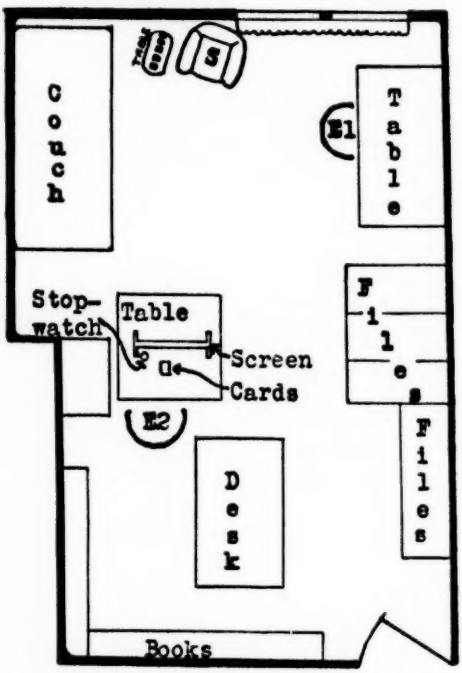

FIG. 1. Rough sketch of experimental room. Approximate dimensions: 20' x 13'. "S" indicates position of subject, with table at his right displaying a sample of each of the five ESP symbols. "E1" and "E2" are the positions of the two experimenters.

the other experimenter (E2) held the cards behind a screen placed upright on the table in front of the experimenter. The deck was held face down close to the table; on each trial, the experimenter removed the target card from the pack without looking at it and held it a little

apart face down until the subject made his call. Then the card was placed in a separate pile and the next card made ready for the subject.

The wooden screen was 24 inches long and 18 inches high, and near its center was a cut-out section about 4½ inches square. On the Known runs, as soon as the subject's call had been made and recorded, the experimenter behind the screen held the target card up in the "window" so that the subject could see whether he was right or not. On Unknown runs the experimenter merely placed each card in a separate pile after it was called. From the subject's position in the low easychair, it was impossible to see the cards unless one was held up at the screen opening. At all other times the experimenter held the pack face down near the table and close to the base of the screen. At no time did the experimenter look at the card before the subject called it.

The Subjects. Thirty-six subjects took part in the experiment[4]; 12 were men and 24 were women. With one exception, they may be classified as young adults ranging in age from 18 to 30 (the one exception was a Duke undergraduate aged 53). Twenty-five were students, mostly from Duke University. The rest were young people from the local area. All were volunteers who responded to requests for subjects.[5] They knew in advance that the purpose of the experiment was to study relationships between ESP scores and various personality ratings. They were asked to come for one session only, of approximately one and a half hours' duration, and none of them was paid for participating. Twenty-five of the subjects were completely unknown to both experimenters prior to the test session; with the remaining 11 subjects, one or both experimenters had varying degrees of acquaintance ranging from having met them once to having known them well for several years.

Description of an Experimental Session

We shall describe here the full procedure followed in an experimental session, asking the reader to remember that for some subjects the order of the Unknown and Known runs was the opposite to that given here and that for some subjects also the roles of the two experimenters were reversed.

Before the testing began the experimenters usually discussed with the subject matters of general interest. Then the general purpose of

[4] Fifty subjects were called for in the original plan of the experiment, but the time available made it impossible for us to secure more than 36.

[5] We wish to thank especially those who assisted us in recruiting subjects: Dr. Wally Reichenberg-Hackett, Miss Laurel Glass, Dr. Jack Kapchan, and Miss Beatrice Boericke.

the experiment was explained again to the subject (that it was a study of the relation of ESP and personality test levels); and he was asked to fill in a shortened form of Cason's Test of Annoyances (to be described later) while the experimenters set the stage for the ESP tests.

During the five or so minutes it took to complete the annoyance questionnaire, JFN went to his office to obtain the 16 packs of cards (in their boxes). BMH stayed with the subject, answering any questions and arranging the record sheets. On JFN's return the boxes of cards were placed in the desk drawer immediately behind the chair of the experimenter who was to handle the cards.

The experimenters described in detail and demonstrated for the subject exactly how the tests were to be made. He was told that on some packs he would not know his score until all 25 cards had been called, and that on other packs he would see the actual target card as soon as he said what he thought it was.

With regard to the latter case, we drew for the subject's benefit an analogy with learning theory. In the moments before he utters his call a subject may (and often does) have an assortment of impressions, thoughts, and feelings running through his "mind." He calls. Quickly afterwards he sees from the card at the window whether his call was right or wrong. Can he *learn* how to guess correctly by comparing the preceding mental events with the actual result, and thus as it were learn how to distinguish between favorable preceding events and unfavorable ones? If so he will gain an advantage for his ESP in the Known runs, and he may be able to carry the benefits to the Unknown runs also.

The subject was told also that the cards had been prepared from random numbers tables and that the number of times each symbol appeared varied in a chance way from pack to pack so that it was useless to try to infer by logical processes anything about the composition of any of the packs.

In addition to trying to call the symbol on the target card, the subject was also asked to say *which* of his calls he felt were right. It was mentioned to him that on some trials he might have an impression of "correctness," or a feeling that the call just made was "better" than others, or even a feeling that this call was "different" from the others. On such occasions he was to follow his call immediately with the word "check": thus, "star, check." The recording experimenter then put a check mark next to that call on the record sheet. (See Figure 2.) On Known runs, the subject would know immediately afterwards whether he had been right or wrong in his feeling of success; on Unknown runs he would not know until the routine check-

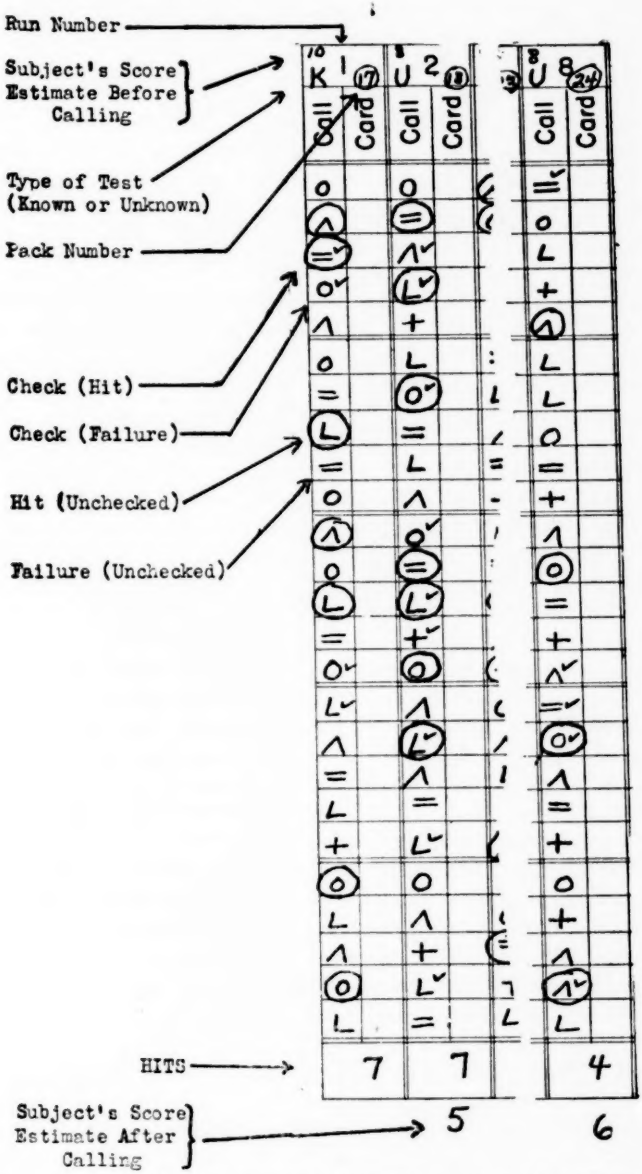

FIG. 2. Copy of part of a record sheet. The target cards were separately listed. The uneven break between Runs 2 and 8 indicates that for the sake of brevity Runs 3 to 7 are omitted.

up at the end of the run whether his impressions of correctness coincided with hits. He was instructed to try to learn to identify any special feeling accompanying right calls. Subjects were urged to call *between 5 and 10 checks* per run. Some subjects were reluctant to do this, many apparently feeling embarrassment when their "checks" did not match the hits, and the experimenters frequently had to use friendly persuasion to get some subjects to say "check" at all.

(The evaluation of the "checks" and of the relation of personality scores to success on checking will be the subject of another report and will not be dealt with further in this paper.)

After the experimenters were satisfied that the subject understood the procedure, the subject was seated in the easychair and the experimenters took their places. The experimenter handling the cards sat down behind the screen and removed the first pack of cards from the desk drawer. He took it out of its box, laid aside the folded card order slip without opening it, and held the pack face down until the test actually started.

The experimenter who was to record the subject's calls filled in the details of the session (date, subject number, pack number, etc.) on his sheet, and then, just before the run began, he asked the subject to give an estimate of the number of hits he expected to make in that pack. This number was recorded at the top of the column.

Let us say that the first run for this subject was an Unknown one. When he was ready, the subject began calling and proceeded at his own rate of speed. E2 held each card face down (without looking at it) while the subject called it. Just as the subject made his first call, E2 started a stop watch so that the exact time consumed in calling the pack could be recorded. (The subjects were never told that they were being timed and to the best of our knowledge none of them knew the stopwatch was going throughout each run.)

As soon as the subject made a call, the experimenter placed the card down on the table behind the screen, and held the next card in readiness for the call. The run proceeded in this manner until all 25 cards were called. The subject knew that as soon as he had made a call, the next card would be in position so that it was not necessary for E2 to give any signal. As soon as the last card was called, E2 stopped the watch and recorded the time indicated.

The first experimenter then asked the subject to give another estimate of the number of hits he thought he had made in the run. Experience shows that a subject's mood may change during the course of the run and we wished to see whether his estimate before or after the run was more accurate or revealing. This second estimate was obtained only on Unknown runs since of course in the Known runs,

the subjects were already aware of the number of their hits. (The material dealing with score estimates has not yet been evaluated, and will be mentioned in a later report if it proves interesting.)

The subject was then handed a card bearing nine typed words in this order: elated, lucky, enthusiastic, contented, uneasy, annoyed, worried, discouraged, pessimistic. From these words the subject chose the one that most closely described his feeling as he was calling the pack and he wrote this down on a separate sheet of paper. He could, if he wished, qualify the word or add any comment he desired.

The slip of paper showing the target order was next placed beside the record of the subject's calls. With the subject watching, the first experimenter ringed the correct calls and recorded the total at the end of the column. The result was then checked by the second experimenter. Some discussion of the score naturally followed and it was compared with the subject's two estimates of his score. In general the experimenters tried to be genuinely encouraging without showing excessive enthusiasm when high scores occurred. We felt that blowing fanfares over a good score tend to put the subject under strain during subsequent runs and may be detrimental to continued good scoring. When the scores were low we tried to call attention to some favorable aspect of the run, such as hits on checked trials or closeness of one of the score estimates to actual score.

The experimenters resumed their places and prepared for the next run, which in the present example would be a Known one. Again the subject gave his score estimate. When he made his first call, the stopwatch was started. After a brief hesitation in case the subject wanted to say "check" after his call, the second experimenter held up the card in the screen opening. The card was held up only a second or two and then placed back on the table; and the second card was held slightly apart from the pack awaiting the subject's next call.

At the end of the Known runs, no second estimate of the score was given, of course, but the subject was asked as usual to choose a word from the list of nine describing his feeling during the run. These data were collected after the Known runs merely for possible psychological interest; the fact that the subject knew his score makes them of dubious value as indicators of favorable or unfavorable moods for ESP.

The procedure may sound complex, but in practice the score estimates and the choosing of one of the nine words were accomplished in less time than it takes to tell about them. The subjects kept the word-list and their sheet of paper nearby and usually wrote down the word after each run without even being reminded. It was our impression that the various activities other than the simple card-calling kept

the session interesting and prevented a feeling of monotony from creeping in.

After eight runs had been completed (four Unknown runs alternated with four Known runs), the experimenters traded places and a new record sheet was used.

The experiment then continued as before until all 16 runs were completed. Throughout all the tests both experimenters kept notes of the subject's spontaneous remarks, expressions of preferences for the two kinds of tests or for certain symbols, etc. A session usually lasted an hour and a half, although a few subjects took much longer.

At the end of the session the subject was asked to sign his name on each of the sheets bearing his call record. He was given three personality questionnaires (described later) to take along and fill in at home and return by mail. Three subjects filled in the questionnaires before the ESP session, however, and three filled in a part of the questionnaires while waiting for their ESP test. All the rest filled them in afterwards.[6] None of the questionnaires was scored until the entire research was completed.

The Personality Questionnaires

In addition to the shortened form of Cason's Test of Annoyances (1), each subject filled in three longer questionnaires:

(1) J. P. Guilford's "An Inventory of Factors STDCR," a questionnaire yielding five scores for that area of personality generally referred to as introversion-extraversion (4).

(2) The Guilford-Martin "Inventory of Factors GAMIN," a questionnaire giving scores on five measures of temperament (5).

(3) R. B. Cattell's "Sixteen Personality Factor Questionnaire" (also known as "The 16 P.F. Test"), Form A, a questionnaire aiming "*to leave out no important aspect of the total personality* . . ." (3).

In all, these three questionnaires provide scores on 26 personality factors; however, they are not all equally accurate or reliable. From the Cattell test, a new and relatively untried instrument, we arbitrarily eliminated seven factors which were low in reliability (split-half reliability under .70).

Thus we were left with a total of 20 personality test scores: 9 from Cattell's test, 5 from Guilford-Martin's, 5 from Guilford's, and 1 from Cason's Annoyance Test.

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[6] Five subjects did not return their questionnaires. One subject, aged 53, did not fall into our age group of "young adults" and was therefore omitted in our personality study since the questionnaires were standardized on young adult and college populations.

Scores from all 20 measures of personality were studied in relation to the Known and Unknown run scores and to the total ESP scores of our subjects in order to see if high or low ratings on the personality factors were associated with the various levels of ESP scoring. The 20 factors are not all independent of one another, and indeed some of the Cattell scales attempt to measure the same aspects of personality as do the other tests. Nevertheless, we shall report all of these factors in our study, noting to what extent the various measures confirm one another.

In the description of the 20 personality factors to follow,[7] we shall mention only briefly those that appeared to be unrelated to our subjects' ESP scores. Those factors that proved of special interest in relation to ESP will be illustrated with examples of the relevant questions from the inventories.

For the Guilford and the Guilford-Martin questionnaires, each question is answered by marking "Yes" or "No," with an answer of "?" available for those cases when a subject is unable to decide between the other alternatives. For the Cattell inventory some questions are answered by marking "Yes," "In Between," or "No"; others involve a choice and are marked "(a)," "Uncertain," or "(b)." A few questions involve circling one of three words provided.

In all three inventories the questions are not grouped for each factor but are mingled with each other throughout the test; they do not appear in the order we shall use in our examples below.

The Guilford Inventory of Factors STDCR

The five factors of personality rated in this inventory deal with different aspects of what is generally called introversion-extraversion. The first three factors actually represent three different kinds of introversion-extraversion, while the last two, according to Guilford, are mainly concerned with emotional aspects of personality. For each factor the subject is given a score between 0 and 10, the higher score generally indicating the more "socially desirable" characteristic. "Socially desirable" is not of course a scientific phrase, but rather an ethical judgment and we use it here only for its convenient brevity.

(1) Factor S, *Social Introversion-Extraversion.*—A person who receives a low score on this factor is characterized by shyness, seclusiveness, and a tendency to withdraw from social contacts. A person with a high score on Factor S is sociable—he tends to seek social contacts and enjoy the company of others.

[7] The description of the inventories and the factors they measure are drawn largely from the manuals for each questionnaire.

(2) Factor T, *Thinking Introversion-Extraversion.*—A low score on this factor means that a person is inclined to meditative or reflective thinking, philosophizing, analyzing himself and others. A high-scoring person on Factor T is the opposite. Since this aspect of personality appears to bear some relation to ESP, we will add a few examples of the type of questions the subjects are asked to answer (the answer in parentheses indicates extraversion, the opposite answer would indicate introversion):

Are you inclined to analyze the motives of others? (*No*)

Are you more interested in athletics than in intellectual things? (*Yes*)

Are your feelings rather easily hurt? (*No*)

(3) Factor D, *Depression.*—A high score on this scale indicates that a person is cheerful and optimistic, while a low score points to a gloomy and pessimistic disposition, with feelings of guilt and unworthiness.

Examples (answers indicate freedom from depression):

Do you often have the "blues"? (*No*)

Have you often lost sleep over your worries? (*No*)

Can you usually keep cheerful in spite of troubles? (*Yes*)

(4) Factor C, *Cycloid Disposition.*—High scores on this factor are obtained from people endowed with evenness of disposition, and uniform and stable moods; the person with a low score generally has strong emotional fluctuations (hence the description "cycloid"), a tendency to flightiness and emotional instability.

Examples (answers indicate lack of a cycloid disposition):

Do you become angry very quickly and also recover very quickly? (*No*)

Are you usually in good spirits? (*Yes*)

Do you like to change from one type of work to another frequently? (*No*)

(5) Factor R, *Rhathymia.*—A lively impulsive person with a happy-go-lucky, carefree disposition will have a high score on Factor R; a low score indicates a person who is inhibited, overcontrolled, conscientious, and serious-minded.

Examples (answers indicate happy-go-lucky disposition):

Can you usually let yourself go and have a hilariously good time at a gay party? (*Yes*)

Do you ever take your work as if it were a matter of life or death? (*No*)

Do you like to play pranks upon others? (*Yes*)

The Guilford-Martin Inventory of Factors GAMIN
(*Abridged Edition*)

The five scores from this questionnaire indicate "dynamic and aggressive characteristics as well as self-confidence and self-assurance." For each factor the subject receives a score between 0 and 10.

(1) Factor G, *General Activity.*—A high score indicates a tendency to like and to engage in overt action. A low score indicates a disinclination for motor activity.

(2) Factor A, *Ascendance-Submission.*—A high score indicates social leadership as opposed to submissiveness or social passiveness.

(3) Factor M, *Masculinity-Femininity.*—Masculinity of "emotional and temperamental make-up" is indicated by a high score on this scale; a low score indicates femininity. Since men tend to have high scores and women low scores on Factor M, we were not able to apply the correlation analysis to these data. Instead, the ESP scores for the separate groups of men and women subjects were studied in relation to the average M-score of each group.

(4) Factor I, *Self-Confidence.*—A high score indicates self-confidence and a lack of inferiority feelings. A person with a low score on Factor I tends to undervaluate himself and to experience feelings of inadequacy and inferiority.

Examples (answers indicate self-confidence):

Are you easily discouraged when things become difficult? (*No*)

Do you have one or more hobbies or skills at which you are outstanding? (*Yes*)

Do you resent being "kidded" about your peculiarities? (*No*)

Do you always feel that you can accomplish the things you want to do? (*Yes*)

(5) Factor N, *Nervousness.*—A person with a high score on Factor N tends to be calm, unruffled, and relaxed. The person with a low score tends to be jumpy and jittery, is easily distracted, irritated, and annoyed.

Examples (answers indicate freedom from nervousness):

Do long continued noises "get on your nerves"? (*No*)

Do you think you use up more energy than the average person in getting things done? (*No*)

Can you usually sit still without fidgeting? (*Yes*)

Cattell's Sixteen Personality Factor Questionnaire (Form A)

Founded on factor analytic research, this inventory attempts to provide scores for many primary personality factors. A new personality questionnaire, the 16 P.F. Test is still in the process of development and further standardization. Nevertheless we felt it worth while to study the scores on nine of the personality factors in relation to our ESP data. (The nine factors used have reliability coefficients of .70 and above. We recognize the fact that scales with reliabilities of less than .85 are rather unsatisfactory, but we felt that they may be useful in a rough preliminary exploration for suggesting areas of personality worthy of more intensive study.) For each factor the subject receives a score between 1 and 10.

(1) Factor A, *Cyclothymia versus Schizothymia*.[8]—A high scoring person is good-natured, easy-going, cooperative, attentive to people, adaptable, trustful, and warm-hearted. The person with a very low score tends to be spiteful, critical, obstructive, aloof, rigid, suspicious, and cold. (Split-half reliability .84.)

(2) Factor B, *General Intelligence*.—This scale consists of a short list of questions of the type commonly found in intelligence tests. Cattell remarks, "this is the factor of general intelligence . . . as it outcrops in the realm of personality. It is a little surprising that intelligence affects so much of the personality, including the character-like qualities of will and conscientiousness . . ." (2, p. 59). Intelligent persons tend to be conscientious, persevering, intellectual, and cultured; those with low intelligence scores tend to be somewhat unscrupulous, quitting, and boorish. (Split-half reliability .70.)

(3) Factor C, *Emotional Stability versus General Neuroticism*.—The person with a high score on Factor C tends to be emotionally mature and stable, calm, realistic about life, and placid. The person with a low score is described as being "easily annoyed by things and people, dissatisfied with the world situation, his family, the restrictions of life and his own health." He is changeable, emotional, lacking in frustration tolerance, evasive, worrying, and neurotically fatigued. (Split-half reliability .71.)

Examples (answers indicate emotional stability):

Do you find that you have to avoid exciting situations because they fatigue you too much? (*No*)

[8] Throughout Cattell's publications, the factors are identified primarily by letters, the names assigned to the letters by Cattell sometimes being revised as research yields increased insight into the meaning of the factors. The names represent an attempt to assign a general term descriptive of the various items that were found to be associated statistically as a factor.

Do you generally have enough energy at times when you need it most? (*Yes*)

Is your health variable, forcing you frequently to alter your plans? (*No*)

(4) Factor E, *Dominance versus Submission.*—The high score indicates a person who is assertive, independent-minded, attention getting, and solemn. The person with a low score is submissive, dependent, expressive, and easily upset. (Split-half reliability .82.)

(5) Factor F, *Surgency versus Desurgency.*—The person with a high score on Factor F tends to be talkative, cheerful, placid, frank, quick, and alert; the low score indicates a person who is silent, introspective, depressed, anxious, incommunicative, slow, and languid. (Split-half reliability .85.)

(6) Factor H, *Adventurous Cyclothymia versus Withdrawn Schizothymia.*—The high score on this factor is found in people who are sociable, adventurous, frivolous and have strong artistic or sentimental interests and an abundance of emotional response. The low-scoring person on Factor H tends to be shy, retiring, cautious, conscientious, cool, and aloof. (Split-half reliability .74.)

(7) Factor M, *Bohemian Unconcernedness versus Conventional Practicality.*—High scores on this test are made by those who are eccentric, unconventional, sensitively imaginative, undependable, with a placid exterior but showing an occasional hysterical outburst. The low-scoring person is conventional, practical, logical, conscientious, given to keeping his head in emergencies. (Split-half reliability .72.)

(8) Factor O, *Worrying Suspiciousness versus Calm Trustfulness.*—A high-scoring person is inclined to be worrying, anxious, suspicious, and brooding; the low-scoring person tends to be placid and trustful. (Cattell mentions that this *may* not be a stable characteristic of the personality but may reflect a temporary condition of worry and depression.) (Split-half reliability .88.)

Examples (answers indicate worrying suspiciousness):

Do you often crave cheerful, sympathetic company "to cheer you up"? (*Yes*)

Have you ever had a sudden sense of dread and of vague danger for no ascertainable reason? (*Yes*)

When you go to bed do you tend to lie awake a long time before going to sleep? (*Yes*)

(9) Factor Q_4, *Nervous Tension.*—A high score indicates that a person is tense, excited, restless, fretful, and impatient; a low score

indicates just the opposite—a person who is relaxed and free from tenseness. (Split-half reliability .76.)

Examples (answers indicate tenseness):

Do certain small things "get on your nerves" unbearably, though you realize them to be trivial? (*Yes*)

Do you frequently get in a state of turmoil when thinking over the day's happenings? (*Yes*)

Do you, when compelled to remain inactive, begin to "doodle," draw things on a scrap of paper, or busy your fingers with some such activity? (*Yes*)

Cason's Test of Annoyances

In the original form of this test there are 217 statements describing things or situations that are annoying to a large number of people. Since our time was limited, we selected for our study 38 of Cason's statements which we thought might be particularly relevant to our subjects as revealing the types of things in the experimental situation or in the behavior of the experimenters that might be irritating to some subjects.

The subject was asked to mark each statement with a grade of 3, 2, 1, or 0 to indicate whether the thing or situation described was "extremely annoying," "moderately annoying," "slightly annoying," or "not annoying," respectively. A grade of "X" was provided for those statements describing situations which the subject had never experienced.

Some of the statements were:

( ) *A person being a poor loser at a game.*

( ) *A person asking me unnecessary questions.*

( ) *To hear a person talking during a moving picture.*

( ) *To see an untidy room.*

The test is scored by adding all the grades of 3, 2, and 1 which the subject gives for the various annoyances. The total of these grades constitutes the subject's score[9] and indicates the degree of his "irritability" in relation to the other subjects in the group. The annoyance scores for our subjects ranged from 26 to 83, and the average score was 45.75. Subjects with scores of 46 and above, then, were more "irritable" in comparison with those whose scores were 45 and below.

[9] Ordinarily the annoyance score would be computed by adding all grades of 3, 2, and 1 given by the subject, and dividing this figure by the number of statements marked with a score other than "X." Since very few "X's" were given by our group, we found it simpler to use as our scores only the addition of the numerical grades.

General ESP Results

Our 36 subjects called a total of 576 packs of ESP cards. The number of hits obtained in all was only 29 in excess of the number expected by chance and is without statistical significance. (See Table 1.) For the Unknown runs the subjects made 19 fewer hits than expected by chance, and in the Known runs they exceeded chance expectation by 48 hits. The difference between the two types of runs is not significant. The subjects obtained more hits on the second of their two record pages, and they also made more hits when JFN was holding the cards, but none of these differences are large enough to be significant.

Taken as a whole, then, the pooled results show no evidence of ESP. When the subjects are classified according to their personality characteristics, however, we shall find a different picture.

TABLE 1
General ESP Results

PAGE 1						
Experimenter with Cards	*Unknown*		*Known*		*Total*	
	Runs	*Dev.*	*Runs*	*Dev.*	*Runs*	*Dev.*
BMH	72	— 3	72	+ 7	144	+ 4
JFN	72	— 7	72	+ 5	144	— 2
Total	144	—10	144	+12	288	+ 2
PAGE 2						
Experimenter with Cards	*Unknown*		*Known*		*Total*	
	Runs	*Dev.*	*Runs*	*Dev.*	*Runs*	*Dev.*
BMH	72	—38	72	+15	144	—23
JFN	72	+29	72	+21	144	+50
Total	144	— 9	144	+36	288	+27
BOTH PAGES POOLED						
Experimenter with Cards	*Unknown*		*Known*		*Total*	
	Runs	*Dev.*	*Runs*	*Dev.*	*Runs*	*Dev.*
BMH	144	—41	144	+22	288	—19
JFN	144	+22	144	+26	288	+48
Total	288	—19	288	+48	576	+29

Personality Factors and ESP

The general findings on the personality aspects of the work are given in Table 2. Briefly stated, this table shows that correlation coefficients were calculated for 19 measures of personality in relation to extrasensory perception scores: (1) for the Unknown scores,

(2) for the Known scores, and (3) for total scores. Of the 57 coefficients thus calculated 16 are statistically significant, either at the .05 or the .01 level. Not all of these results are independent, but even so we found ourselves confronted with a variety of attractive results in excess of our best expectations.

TABLE 2

Correlations of Personality Test Scores and ESP Scores

Personality Factors	*Unknown ESP Score*	*Known ESP Score*	*Total ESP Score*	*Factor I Self-Confidence*
GUILFORD-MARTIN INVENTORY:				
Factor G, General Activity Level	+.23	—.23	.00	
Factor A, Ascendance	—.05	—.02	—.04	
Factor I, Self-Confidence	+.44*	+.36*	+.55**	——
Factor N, Freedom from Nervousness	+.06	+.52**	+.40*	+.62**
GUILFORD'S INVENTORY:				
Factor S, Social Extraversion	+.21	+.29	+.34	+.54**
Factor T, Thinking Extraversion	+.37*	+.10	+.33	+.37*
Factor D, Freedom from Depression	+.16	+.37*	+.37*	+.71**
Factor R, Rhathymia	+.43*	—.05	+.26	+.42*
Factor C, Lack of Cycloid Disposition	—.05	+.38*	+.23	+.57**
CATTELL'S 16 P.F. TEST:				
Factor A, Cyclothymia	—.05	+.19	+.09	
Factor B, Intelligence	+.29	—.06	+.16	
Factor C, Emotional Stability	+.56**	+.13	+.47**	+.30
Factor E, Dominance	+.27	—.06	+.15	
Factor F, Surgency	+.13	—.02	+.08	
Factor H, Adventurous Cyclothymia	+.19	—.05	—.09	
Factor M, Bohemian Unconcernedness	—.11	—.08	—.13	
Factor O, Worrying Suspiciousness	—.34	—.29	—.44*	—.68**
Factor Q_4, Nervousness	—.20	—.42*	—.43*	—.56**
CASON'S TEST:				
Annoyance	—.03	—.36*	—.27	

The number of subjects N = 30 for all correlations except those for Annoyance where N = 36. One asterisk following a coefficient indicates that it is significant at the 5% level; two asterisks indicate significance at the 1% level or below. Factor M, Masculinity-Femininity, in Guilford-Martin's Inventory is omitted from this table because the method of scoring this factor makes correlation inappropriate.

From the work of our subjects there is evidence that extrasensory perception is related to at least eight factors of personality. The most striking of these is Guilford-Martin's Factor I, *Self-Confidence,* which is highly correlated with the total ESP scores ($r = +.55$; P =

.0015), but the following are also significantly linked with one or other of the two types of ESP test or with both tests jointly:

Thinking extraversion
Freedom from depression
Rhathymia (happy-go-lucky disposition)
Lack of cycloid disposition
Freedom from nervous tension (two separate measures)
Emotional stability
Calm trustfulness
Low irritability level (not, however, a factor in the technical sense)

A cautionary note to be struck here is that seven of the eight items on the above list are themselves significantly correlated with the outstanding factor of self-confidence. Fortunately, it by no means follows that the seven items contribute nothing to the personality picture of ESP. Insofar as we are concerned with *the place and function of ESP in human personality* it seems very probable that all those factors are ESP determinants, subject only to the qualification that the largest determinant is *self-confidence*. The solution of this part of the problem must ultimately be attacked by complex psychological and statistical procedures. These would in themselves be a large undertaking and will not be dealt with in this paper.

Insofar as we are concerned to find *predictive measures* for ESP, the question is quite different, for here the interrelationship of the factors is of crucial importance. Before touching upon this issue we shall first consider some of the more striking factors in isolation. The most impressive of these is Guilford-Martin's Factor I, Self-Confidence.

Self-Confidence

Figure 3 shows how subjects' total scores are related to the self-confidence scores. The relationship is highly significant and the straight line in the figure gives the most exact simple description of the scoring trends in relation to the subjects' self-confidence levels. This line expresses graphically the tendency of subjects with high confidence scores to score positively in the ESP tests and of subjects with low confidence scores to obtain fewer successes in ESP. The positive relationship between confidence and ESP is shown by the correlation coefficient of .55, which would be expected by chance only once in approximately 660 experiments of this size.

The line on the graph was determined by the standard analysis of regression which yielded a regression coefficient of 1.88. This number means that for each increase of 1 point in self-confidence score the ESP score may be expected to rise 1.88 points. From these

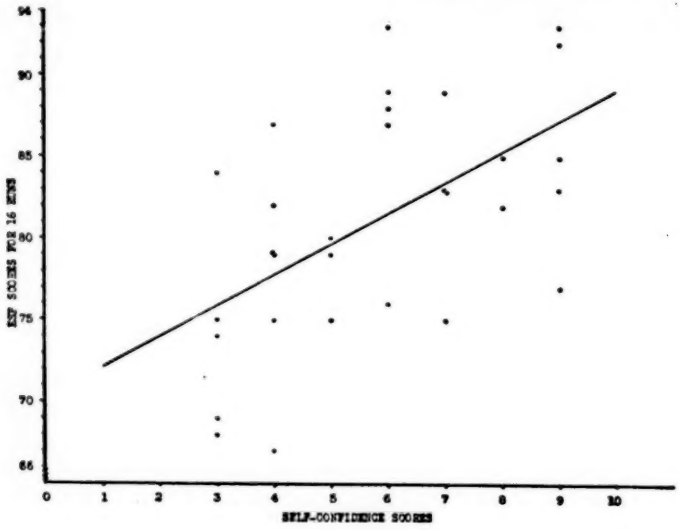

FIG. 3. Relation of total ESP scores to self-confidence (Guilford and Martin's Factor I). In general high and low ESP scores are obtained from subjects with high and low confidence scores, respectively. The straight regression line, determined statistically, gives a general description of the scoring trends. It is true for confidence scores ranging from 3 to 9.

figures we are able to construct an equation for the purpose of predicting subjects' ESP scores on the basis of our knowledge of their self-confidence scores. The equation is:

$$Y = a + b(x - \bar{x})$$

Y stands for the ESP score to be predicted from the equation. The *a* stands for the average ESP score; for our subjects this was 81.10 (for a total of 16 runs). The *b* in the equation is the regression coefficient which we found was 1.88. The *x* refers to the subject's self-confidence score, while the $\bar{x}$ is the average confidence score for our 30 subjects, namely, 5.77. Thus, with these figures from our study inserted, the equation becomes:

$$Y = 81.10 + 1.88(x - 5.77)$$

Observing an equation of this form one may ask some quite specific question like this: "A subject's confidence score is 3; what is his expected ESP score?"

The answer is:

$$Y = 81.10 + 1.88(3 - 5.77)$$
$$Y = 75.9$$

The graph in Figure 3 shows that five persons had 3 as their confidence score. Their ESP scores were: 68, 69, 74, 75, 84. Four of these five scores are below "chance" as predicted. Two of the scores are close to the "predicted" value of 75.9, as can be seen also from the graph. Three of the scores, however, are far from the line. An inspection of the graph will show that some other scores are also dispersed some distance from the line; that is, their ESP scores are not close to what one would predict from a prior knowledge of their degree of self-confidence. Nevertheless, results that come close to predicted values from a single psychological consideration, as here, are naturally a source of satisfaction, especially when such a result would occur only once in 660 times if chance alone were at work. Paradoxically, however, we are less interested in the success of the measure (in the places where it does succeed) than in its *failure* (where it fails, as fail it does). The reasons for this reflection will be given later.

The high correlation found to exist between self-confidence and *Unknown* scores may be of practical interest to other investigators using a standard ESP test like that which we have called "Unknown." The correlation coefficient r is + .44 which has a probability close to .01. In the *Known* test, which is something of a novelty in psychical research, the correlation is appreciably smaller: $r = +.36$; $P = .05$. On the evidence available the self-confidence measure seems more effective in the Unknown kind of test than in the Known.

That the increase of ESP scores with increase of self-confidence is not an artefact ascribable to the heavy influence of one or two subjects is demonstrated in the table below. The average self-confidence score was 5.77. Using this figure, we have divided the subjects into two groups: Self-confident and unself-confident. Total ESP scores are divided into those who scored above expectation and those who scored at or below.

ESP Deviation

	+	0, —	Total	
Self-confident Subjects	13	3	16	(81% positive)
Unself-confident Subjects	3	11	14	(79% negative)
Total	16	14	30	

The table shows that 81% of the self-confident subjects scored above chance expectation and 79% of the less confident subjects scored below the mean. The table was evaluated by the exact method which provided P = .0015, leaving negligible doubt as to the generality of the effect among the subjects.

When the inquiry into self-confidence is pushed a stage further, some interesting findings arise from its relationship with position effects. It will be recalled that a different experimenter held the cards for each half of the session, and the data for each half were recorded on separate record sheets. Thus each session is divisible into two parts, and each part contains four pairs of runs, one Known and one Unknown run per pair. The ESP scores for the four positions thus arising in the combined halves of the session are shown for the confident and unconfident subjects in Table 3. The total scores for the four pairs of positions obtained when the two data sheets are pooled are plotted in Figure 4 for the confident and unconfident subjects separately. The points of interest shown in the graph are:

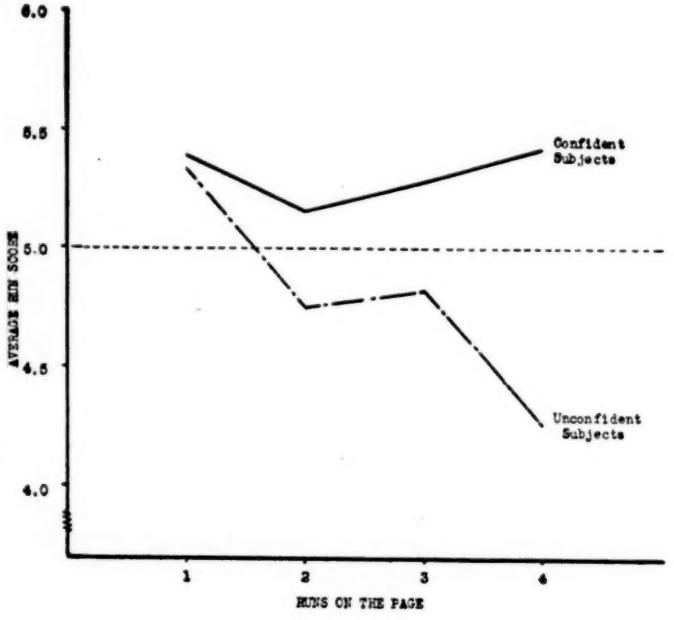

FIG. 4. Position effects of confident and unconfident subjects. The positions represent the sum of the two half-sessions, each position in each half consisting of one Known and one Unknown run for each subject.

1. Self-confident percipients score above the chance level for every position.
2. The saucer-form of the self-confident subjects' curve is more apparent than real: the scores do not vary significantly from a straight horizontal line. The confident subjects score ***consistently high.***
3. The unconfident people begin by exercising ESP almost as successfully as the confident ones.
4. Their success is short-lived and their fall in scores at run positions 2, 3, and 4 is heavy. (The apparent slight rise at position 3 is statistically insignificant.) The descent is virtually continuous: unconfident subjects *consistently decline* in their scores. The straight line representing the fall of the scores has an F ratio of 8.87, which with 1 and 220 degrees of freedom has a probability of .003.[10]

TABLE 3

Position Effects in Relation to Self-Confidence

CONFIDENT SUBJECTS

	Runs on the Page								Total	
	1		2		3		4			
	Runs	Dev.	Runs	Dev.	Runs	Dev.	Runs	Dev.	Runs	Dev.
Page 1	32	+ 2	32	— 1	32	+10	32	+ 2	128	+13
Page 2	32	+23	32	+11	32	+ 8	32	+25	128	+67
Total	64	+25	64	+10	64	+18	64	+27	256	+80

UNCONFIDENT SUBJECTS

	Runs on the Page								Total	
	1		2		3		4			
	Runs	Dev.	Runs	Dev.	Runs	Dev.	Total		Runs	Dev.
Page 1	28	+ 4	28	+ 7	28	—12	28	—13	112	—14
Page 2	28	+15	28	—21	28	+ 2	28	—29	112	—33
Total	56	+19	56	—14	56	—10	56	—42	224	—47

[10] The downward slope of the successive run scores of these subjects was tested by fitting a first order orthogonal polynomial.

The result, being an F ratio, has two sets of degrees of freedom, the residual variance (3.290) accounting for 220, as indicated above, and the linear regression variance (28.608) having of course the usual one degree of freedom. For the method of computation, reference may be made to: G. W. Snedecor's *Statistical Methods,* 4th Ed. (Ames, Iowa: The Iowa State College Press, 1946), Chapters 11 and 15; or to K. A. Brownlee's *Industrial Experimentation,* 3rd Ed. (London: His Majesty's Stationery Office, 1948), Chapter 9, **Section (i).**

5. Though a rigorous proof is not yet available, inspection suggests that in the late stages of each half of the session, the unconfident subjects were actually missing the target cards more often than would be expected by chance. It is as if some subconscious Imp of the Perverse were saying: "I know the card now in the experimenter's hand is a cross, but I will call it a circle."

Emotional Stability

This factor (Cattell's Factor C) is significantly correlated with the total ESP scores ($r = +.47$; $P = .01$). The relationship is displayed in Figure 5. The data are satisfactorily represented by a straight line, which is shown in the figure. This line has the following regression equation, in which the letters bear the same meaning as before except that x now means emotional stability score, $\bar{x}$ is the average such score for the 30 subjects, and b, the regression coefficient, in this case is 1.36.

$$Y = a + b(x - \bar{x})$$
$$Y = 81.10 + 1.36(x - 6.90)$$

It is clear that in general the more stable a subject's emotions the higher is his ESP score, and conversely persons who tend to be

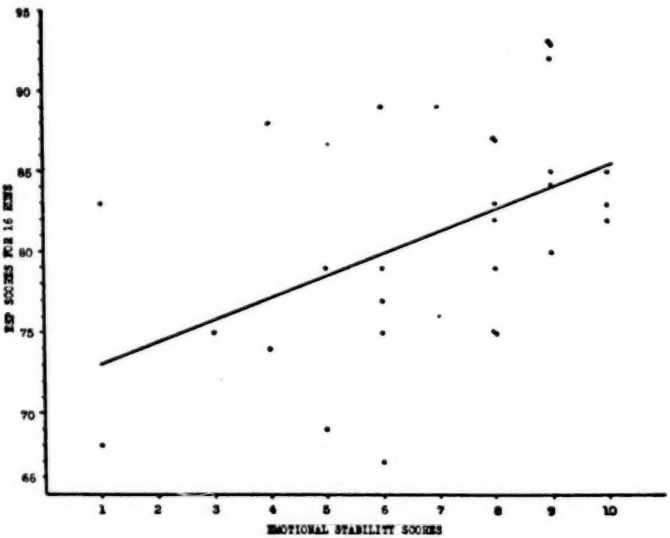

FIG. 5. Relation of ESP to emotional stability (Cattell's Factor C). In general high and low ESP scores are obtained from subjects with high and low emotional stability scores, respectively. The straight regression line, determined statistically, gives a general description of the scoring trends.

emotionally unstable[11] make the smallest ESP scores. As in the case of self-confidence, this statement tells only part of the truth. If degrees of emotional stability were the sole determinant of ESP, then the dots on the diagram would be strung along the line like beads, or be very close to the line. A glance at the figure shows that while some of the points are close to the line, others are far removed from it. It is those latter "outriders" (what may be called *failures* that do not comply with expectation) that are of the greatest interest in this type of research.

Examining the scores of the five subjects briefly noted in the previous section, where they were all expected by the self-confidence measure to have a score of approximately 76, we can see now what the same subjects' scores would be when "predicted" by the emotional stability measure:

Actual Scores:	68	69	74	75	84
Scores Predicted by Emotional Stability:	73	79	77	80	84

The predicted scores have been computed to the nearest whole number. One score (84) is in precise agreement with prediction; the others are all at or below chance as predicted. This is satisfactory so far as it goes, but it will be noted that while the general agreement is good, the detailed comparisons are less satisfactory.

The generality of the effect, however, is confirmed by the table below in which it is shown that 72% of the emotionally stable subjects scored above chance expectation and 75% of the emotionally "unstable" subjects scored below the expected chance score (none scored at the chance level). Computation by the exact method yields a probability of .014.

	ESP Deviation			
	+	0, —	Total	
Emotionally Stable Subjects	13	5	18	(72% positive)
"Unstable" Subjects	3	9	12	(75% negative)
Total	16	14	30	

[11] Our subjects averaged 6.90 on emotional stability as compared with the average of 5.5 for Cattell's standard group. For ease of reference we shall refer to the subjects below our mean as being emotionally "unstable," but it should be remembered that this is a relative term and that a more correct designation would be "less stable."

So much for the influence of emotional stability on *total* ESP score. When we examine the matter a little closer, there is a surprising result. Separating Known from Unknown tests, we find that the correlation of emotional stability with Unknown scores is highly significant, but with Known scores, insignificant. (Unknown $r = +.56$; $P = .0015$, which is highly significant. Known $r = +.13$; $P > .20$, which is quite insignificant.) This means that emotional stability is related to the standard ESP test but not to the other test.

The cause of this differential effect of the two tests is shown in the table below:

	Average Run Score	
	Unknown	*Known*
Stable Subjects	5.22	5.27
"Unstable" Subjects	4.69	4.93

Broadly speaking, stable subjects do equally well on both tests, but "unstable" subjects are much poorer in the Unknown situation than in the Known. Thus it is the downward trend of the "unstable" subjects' scores in the Unknown situation that produces the general high correlation. In Known tests "unstable" subjects score close to chance (*as if* no ESP were functioning at all), but in the Unknown tests their scores fall rather heavily. The cause of this is anyone's guess. With only a mild play on words we may wonder whether instability is associated with "fear of the (ESP) Unknown."

Nervousness

Other aspects are only a little less interesting than the two that have just been discussed. One of these is Guilford and Martin's Factor N, Nervousness, in which persons who are free from nervous feelings receive high N-scores and those who are nervous and tense receive low N-scores. This personality factor correlates with total ESP scores ($r = +.40$), and is significant. A strong distinction must be drawn here between the effect of nervousness on subjects in raising or lowering their ESP scores in the two contrasted ESP situations—the Unknown and Known tests. In the standard ESP test (Unknown) the factor of nervousness appears to have no effect on the subjects' scores. A subject's score on this personality test gives no clue to his likely score in the Unknown ESP situation. (See Table 2.) On the Known ESP test, however, the effect of degrees of nervousness comes out strongly. The correlation coefficient is $+.52$, which is significant with a probability of .0027. In this situation our percipients saw the result of each call immediately after they had made it, and to a few of our subjects this experience

appeared to be unnerving. It was as if this test was a challenge which those gifted with the proverbial nerves of steel (if an unscientific expression may be permitted) survived, and those who were not so gifted went under. What is more surprising is that the unnervous subjects scored significantly better in the Known situation than in the Unknown. The difference is represented by a χ^2 of 4.52, $P = .033$. Nervous subjects actually scored almost as well on their Known runs as on their Unknown runs, the difference being quite negligible. It follows therefore that the significant correlation between Factor N and Known ESP scores is due not to nervous subjects being adversely affected by the Known situation but to the unnervous subjects being benefited by it. Those latter percipients are presumably of the type whose calmness of disposition enables them to draw out their strongest powers when they are met with a challenging situation. If this finding should be confirmed, it would be open to discussion whether a difficult ESP situation may not be a promising means of obtaining high scores from the right type of subject.

Cattell's Factor Q_4 professes to measure the same elements as Guilford-Martin's N, namely, Nervousness, and it is reassuring to report that our research provided similar results from the two tests, thereby suggesting that the Cattell and Guilford-Martin measures confirm each other. (Because of the method of scoring a negative correlation in Cattell is equivalent to a positive correlation in Guilford-Martin.) For both tests, correlation with total ESP is significant, with Known ESP significant, and with Unknown ESP insignificant.

Depression

Freedom from Depression (Guilford's D), which measures degrees of the optimistic and pessimistic outlooks on life, is linked to success and failure in Known ESP, the optimists having the better of matters. The factor, however, seems to have small relationship with Unknown ESP.

Cycloid Temperament

Cycloid temperament (Guilford's C) shows a similar effect—correlation with Known, almost no correlation with Unknown. With both Freedom from Depression and Lack of Cycloid Disposition, the significant correlation for Known tests is due mainly to the tendency for the cheerful people endowed with an even disposition to increase their scores above the chance level. The contrasts between the effects of the two ESP tests have already been shown more strikingly by the measure of nervousness (Guilford-Martin's N, above). We made a special examination of the interrelationships of

these factors, Nervousness, Depression, Cycloid Disposition (as personality functions, disregarding ESP), and found them highly interrelated, the *r*'s varying from .75 to .89. Thus, at least for our subjects, the three scales are measuring virtually the same aspect of personality and the results from the three should not be considered as independent. A description of our results in relation to nervousness, for example, covers the other two factors also.

Thinking Introversion-Extraversion

When the Thinking Introversion-Extraversion scale (Guilford's T) was applied to Known ESP tests there was little difference between subjects. In other words, Guilford's T does not distinguish levels of ESP in the Known situation. The correlation is positive but small ($r = +.10$), in favor of extraverts.

When, however, the subjects do not learn the results of their guesses until the end of the run (Unknown ESP), the personality test does differentiate between levels of ESP ($r = +.37$; $P<.05$). The more extraverted a percipient the higher is his score; the more introverted, the lower his score.[12]

In the Known test there is little difference between the thinking extraverts and introverts. If they are divided into two groups at their mean T-score (4.46), we have for the Known trials:

	Runs	Dev.
Extraverts	128	+12
Introverts	112	+20

The difference is negligible. But for the Unknown trials, we have

	Runs	Dev.
Extraverts	128	+26
Introverts	112	—25

A slight improvement by the extraverts is accompanied by a heavy fall for the introverts. The reason is difficult to determine at this exploratory stage of the work, but it may be that introverts are less disturbed psychologically when they know the result of a call immediately after it is made than when they are obliged to wait until the end of the run before knowing the result of their calls.

As has been said earlier, the thinking introvert is given to meditative or reflective thinking, philosophizing, and analyzing himself and

[12] In general very high scores on Factor T (extreme extraversion) are not considered desirable for mental health. However, the maximum possible score is 10 and none of our subjects exceeded 7. The lowest score was 2 (one subject), so that altogether our team of subjects did not exemplify the extreme limits.

others. Literature affords many examples, like Raskolnikov in *Crime and Punishment,* and the Prince in *Hamlet.* In their extreme form they "think too much." Assuming for the moment the validity of the significant correlation over the general population, one might imagine introverts to resemble the Prince in their analytical meditations. "A square or not a square, that is the question." The qualifications, the hesitations, the buts and the ifs.

> "And thus the native hue of resolution
> Is sicklied o'er with the pale cast of thought,
> And enterprises of great pith and moment
> With this regard their currents turn awry
> And lose the name of action."

Whether too much reflection causes the currents of successful paranormal cognition to be turned awry, it is impossible to say in the present stage of our ignorance, but the point may be worth remembering in future researches.

Rhathymia

Rhathymia (Guilford's R), which varies from happy-go-luckiness at one end of the scale to severe inhibition at the other, is shown to have little relation to the Known clairvoyance tests but to be significantly correlated with the standard Unknown tests. (Unknown $r = +.43$; $P = .015$). A close examination of the correlated data (such as we have applied to all the correlations) shows, however, that the effect is due mainly to the "weight" of three of the four subjects at the highest point of the R-scale. The average scores of the four subjects were 4.63, 5.75, 6.13, and 6.50 (for 8 runs each), and their R-scores were 9 in each case. When these four are omitted, the significance of the correlation disappears. That the correlation is not general through the 30 subjects is evident from the fact that the proportion of high ESP scores from happy-go-lucky percipients is almost the same as from inhibited percipients. In the accompanying

	Unknown ESP Deviation		
	+	0, —	Total
"Happy-go-lucky"	5	6	11
"Inhibited"	9	10	19
Total	14	16	30

table the mean R-score (5.40) is taken as the dividing line between "happy-go-lucky" and "inhibited."

This is one of those tables whose distribution is so close to chance as almost to beg to be left uncalculated. The investigators themselves experience a certain lack of the happy-go-lucky feeling in the face of an unwelcome result of this sort. For the present Rhathymia had better be placed in cold storage.

Worrying Suspiciousness

The spirit of worrying suspiciousness (Cattell's Factor O), which, as it descends the scale, ends in the opposed state of calm trustfulness, is found to be negatively correlated with total ESP scores ($r = -.44$; $P = .012$.) A high mark on this personality scale implies an "undesirable" quality, a low mark a "desirable" quality. Since the low-marked "desirable" quality is associated with high ESP, the sign of the correlation coefficient is minus. The separate correlations with Unknown trials ($r = -.34$) and Known trials ($r = -.29$) are large enough to be interesting but are short of statistical significance.

Annoyance

Cason's Test of Annoyances provides a rough estimate of a person's irritability level—that is, whether he is more or less annoyed by certain situations or things than are others in his group. Since this test was given during the experimental session, annoyance scores are available for all 36 subjects. The correlation with the total ESP scores is not significant. Known ESP scores are negatively correlated with annoyance, subjects who were not easily annoyed giving higher scores on the Known test than subjects who were "irritable" ($r = -.36$; $N = 36$; $P = .01$). At first glance this seems understandable: one might expect that the more irritable subjects would become annoyed by the Known tests, generally a "strain-producing" situation, and that their ESP scores might suffer according to the degree of annoyance they felt. Inspection of the data shows that this speculation falls short of the mark. The "irritable" subjects went only slightly below chance on the Known test (average run score, 4.91). The "unirritable" subjects soared to greater heights on the Known test than on the Unknown. Whereas they averaged 5.01 hits per run on the Unknown, they rose to an average of 5.37 hits per run in the Known tests, giving a deviation that is significant at the 2% level.

When the subjects are divided according to whether their Known ESP scores were above or not above chance expectation, we obtain the following distribution:

	Known ESP Deviation +	0, —	Total
"Irritable" Subjects	6	10	16
"Unirritable" Subjects	13	7	20
Total	19	17	36

The difference between "irritable" and "unirritable" subjects in relation to their ESP success is not significant (by the exact method $P = .095$). Though both outcomes had better be regarded as inconclusive, there is a strong suggestion that Cason's Annoyance Test does distinguish between high and low scores in Known ESP tests.

Other Personality Factors

A number of the personality factors proved unpromising as tools for future research. These need be considered only briefly.

Guilford's Factor S, Social Introversion-Extraversion, was positively correlated with both types of ESP tests, but the coefficients did not reach significance. The correlation of Factor S with total ESP scores is, however, too large to be ignored ($r = +.34$). The associated probability is around .06.

The two separate measures of ascendance or dominance (Guilford-Martin's Factor A and Cattell's Factor E) gave insignificant correlations with both types of ESP tests and with their total.

General Activity Level (Guilford-Martin's G) provides no association with total ESP, but rather curiously there is a mild (though insignificant) relationship with both Unknown and Known tests, though *in opposite directions*. This suggests that high general activity is related to high scores in the Unknown situation, but with low scores in the more exacting Known situation. However, the correlations are too small to permit conclusions to be drawn.

Both of Cattell's measures of different aspects of cyclothymia (Factors A and H) are nowhere significantly correlated with ESP. Neither does his Factor M, Bohemian Unconcernedness versus Conventional Practicality, appear to be related to our subjects' ESP data.

Perhaps the most surprising failure is the lack of any association between the ESP scores and Cattell's Factor F, Surgency. Cattell remarks that this is one of the "best defined traits in the realm of

personality," and is strongly related to extraversion-introversion. In view of our correlation of Unknown scores with Guilford's Thinking Introversion-Extraversion and of Humphrey's previous correlation of ESP and Bernreuter's introversion-extraversion scores (6), we might have expected Cattell's Surgency to show more of a relationship with ESP in our study; but none of the correlations is large enough to be of any interest.

Intelligence (Cattell's Factor B) is of no interest to total and Known ESP scores. The correlationship with Unknown ESP is faintly hopeful, and if improved in later research would offer some confirmation that intelligence is positively related to ESP success. One possible reason for the failure of this intelligence measure to show a higher correlation is that our range of intelligence scores was very small. Only 4 subjects had scores below 6 on this scale (where scores may theoretically range from 1 to 10); thus our group may be considered higher in intelligence than the average group of college age.

The relationship between our ESP scores and the factor of Masculinity versus Femininity (Guilford-Martin's M) remains uncertain. Because women are expected to have low scores, and men high scores on this scale, we did not apply the usual correlation method. We divided the subjects according to sex, and each group was rated for degrees of masculinity-femininity as shown by the Guilford-Martin scale. Using the average masculinity-femininity score of our men subjects as the dividing point, we compared the ESP scores of those men above the group average with the ESP scores of the men below the average. The same procedure was followed with the women subjects, their average M-score serving as the separation point. A high M-score for both men and women indicates "masculinity of emotional and temperamental make-up." The table below shows the results. In general it looked as though "masculine" subjects of *either* sex were likely to obtain the larger ESP scores, but the differences are not significant. It is plain that any effective use of the masculinity-femininity scale would require a larger sample of subjects than was available here.

We also considered the possible relation of masculinity-femininity ratings with ESP scores obtained with the two different experimenters handling the cards. These results are shown in the same table. Here again the results are not significant, although there appears a slight tendency for women subjects to score higher in ESP when the male experimenter was handling the cards and for men subjects to give higher ESP scores with the female experimenter holding the cards.

TABLE 4

ESP Scores in Relation to Masculinity-Femininity

MEN SUBJECTS (N = 10)						
Masculinity Score (Mean = 7.3)	Experimenter with Cards JFN Runs	Dev.	BMH Runs	Dev.	Total Runs	Dev.
Above Mean	40	— 1	40	+10	80	+ 9
Below Mean	40	— 9	40	+ 2	80	— 7
Total	80	—10	80	+12	160	+ 2
WOMEN SUBJECTS (N = 20)						
Masculinity Score (Mean = 4.1)	Experimenter with Cards JFN Runs	Dev.	BMH Runs	Dev.	Total Runs	Dev.
Above Mean	48	+21	48	+ 7	96	+28
Below Mean	112	+29	112	—26	224	+ 3
Total	160	+50	160	—19	320	+31

It will be noted that our most encouraging correlations came from the tests of Guilford and Guilford-Martin rather than from those of Cattell. This is quite satisfactory from the experimenters' point of view, since it is known that the Guilford and Guilford-Martin tests are more reliable than the present form of Cattell's questionnaire.

Combined Effect of Confidence and Emotional Stability

We come now to the main purpose of this research to which all the previous dissertation has been leading. Almost all work in the last fifteen years has been designed to find the relationship between single personality factors and extrasensory perception. The present investigation, as has been stated, was intended to explore a much wider area of personality with a view to finding two or more factors of personality which taken in conjunction would provide a more exact measure of the relationship between personality and ESP than any one factor taken alone.

If the reader will refer again to Figure 3 and the remarks bearing upon it, he will observe that our main interest was not in the success of the confidence-ESP relationship (which is obvious from its highly significant value), but in the degree of its failure demonstrated by the fact that some of the plotted points lie neither on the regression line nor near it, as would be the case if self-confidence were a *perfectly* correlated measure of ESP. Evidently some other personality factor or factors are causing a considerable dispersion of the plotted points.

What are those other, disturbing factors?

The business of the research was to discover the causes of the unexplained variation shown in our results, as pictorially revealed in the graphs; to measure the weight or importance to be attached to each cause, and then to build all such findings into a general picture of the inter-working of ESP and human personality.

This portion of the research was purely exploratory. We had available measurements from a large number of personality factors, but with so small a sample—30 subjects—it would be entirely out of the question to try to fit the ESP scores to any large number of these variables simultaneously. For the present stage of the study we limited our search to finding a pair of variables which would more accurately determine the ESP scores than either single variable taken alone. One of these variables must inevitably be the spectacularly successful self-confidence, Guilford-Martin's Factor I. The second factor must be one that was only moderately correlated with self-confidence. Emotional stability, Cattell's Factor C, recommended itself for this duty as a glance at Table 2 will show. Its correlation with self-confidence was only moderate ($r = +.30$), but it is highly correlated with total ESP score ($r = +.47$).

In order to measure the association of ESP scores with two personality variables, we used the technique known as multiple correlation.[13] This procedure resembles that for simple correlation except that here we compare ESP scores with two personality scores at once instead of with only one. It is important to note that the multiple correlation formula *eliminates the correlation of the two personality variables with each other,* and hence provides a measure of the *independent effects* of the two personality factors on the ESP scores.

Studying the ESP scores in relation to both self-confidence and emotional stability, we found the multiple correlation coefficient R (analogous to the simple correlation coefficient r). In our case we have

$$R = .6538$$

To find the anti-chance probability of the multiple correlation, it is convenient to use the analysis of variance technique for the related measure of multiple regression, which is presented below:

[13] A comparatively simple account is given in J. P. Guilford's *Psychometric Methods* (New York: McGraw-Hill, 1936). Where we have preferred analysis of variance descriptions, we have followed R. A. Fisher, *Statistical Methods for Research Workers* (8th Ed., Edinburgh: Oliver and Boyd, 1941), and M. G. Kendall, *The Advanced Theory of Statistics,* Vols. 1, 2 (London: Griffin, 1945, 1946).

Analysis of Variance in Multiple Regression

Source of Variation		Degrees of Freedom	Mean Square	F	P
Multiple Regression,	$R^2S(y - \bar{y})^2$	2	313.93	10.08	.0006
Residual,	$(1 - R^2)\ S(y - \bar{y})^2$	27	31.14		
Total	$S(y - \bar{y})^2$	29			

With a probability of 6 in 10,000, the regression is highly significant.

In doing the analysis for multiple correlation, we also obtained two new regression coefficients similar to those mentioned earlier for self-confidence and emotional stability separately. The new coefficients take into account, however, the interrelationship between the two personality factors. The regression coefficient for self-confidence and ESP when emotional stability is held constant is 1.54. And the coefficient for ESP and emotional stability when self-confidence is held constant is .97. From these two coefficients we can determine the relative importance of the two personality factors for ESP. The total of the two coefficients is 2.51 (the total effect of rise or fall of ESP scores accounted for by both personality factors together). The regression coefficient for self-confidence provides 61% of the total (1.54/2.51). For emotional stability the regression coefficient is 39% of the total. This result is what one would expect in view of the closer relationship of clairvoyance to self-confidence than to emotional stability (as shown by the simple correlations in Table 2).[14]

With these new regression coefficients we may now construct an equation for predicting a subject's ESP score when we know both his self-confidence and emotional stability scores:

$$Y = 81.10 + 1.54(x_1 - 5.77) + .97(x_e - 6.90)$$

The figures in this equation have been encountered before. The average ESP score (for 16 runs) is 81.10, the average self-confidence score is 5.77, and the average emotional stability score is 6.90. The figures 1.54 and .97 are the new regression coefficients just mentioned. So, to get a prediction of a subject's ESP score, we simply substitute his confidence score for x_1 in the equation, and insert his emotional stability score in place of x_e. For example, if a subject's scores were 4 for confidence and 8 for emotional stability, we would have:

[14] The test of significance for the two coefficients separately:

	b	S. D.	D. F.	*t*	P
Confidence	1.5436	.5249	27	2.94	.009
Emotional Stability	.9729	.4456	27	2.18	.04

$$Y = 81.10 + 1.54(4 - 5.77) + .97(8 - 6.90)$$
$$= 81.10 - 2.73 + 1.07$$
$$= 79.4$$

In the sections on self-confidence and emotional stability, comparisons were made between the scores "predicted" by those measures and the scores actually obtained. *In general* the predicted scores agreed with those observed, but *in detail* some individual predicted scores departed markedly from those observed. The following table uses the scores of the same five subjects and is intended only as an illustration of how the joint use of two personality measures gives a more accurate prediction of scores than either of them used separately.

Subject	Actual Score	Deviation of Actual Score from Predicted Score: Using Confidence Alone	Using Emot'l Stability Alone	Using Both in Combination
A	84	+ 8	0	+ 5
B	68	— 8	— 5	— 3
C	74	— 2	— 3	0
D	69	— 7	—10	— 6
E	75	— 1	— 5	— 1
Sum of Deviations |x|		26	23	15

The use of the two measures together—even when their intercorrelation is removed—gives a better account of the experimental results than either measure used separately. The reason presumably is that the subjects' self-confidence and emotional stability *both* exert an influence on their ESP scores.[15]

Multiple regression (or correlation) is the most efficient method of dealing with the interaction of a network of psychological influences. In a rough and ready way, however, the outcome can be summarized by considering the ESP scores of the subjects when they are separated into various groups according to whether they are above or below the group mean for each personality category as in the table below:

Description of Subjects	Runs	Dev.	Average Score	Description of Subjects	Runs	Dev.	Average Score	χ^2 (Diff.)	P
Confident	256	+80	5.31	Unconfident	224	—47	4.79	8.15	.0045
Stable	288	+70	5.24	"Unstable"	192	—37	4.81	5.47	.019
Confident *and* Stable	192	+63	5.33	Unconfident *and* "Unstable"	128	—54	4.58	10.79	.001

[15] We have not attempted to show graphically the relation of ESP to both confidence and emotional stability. Instead of a straight line such as appeared in previous graphs, there would now be a plane in 3-dimensional space.

Here we can see that that group of subjects who are both confident and stable give higher ESP averages than those given by either the stable or the confident groups. Similarly, those subjects who are both unconfident and "unstable" give a lower ESP average than that of either the unconfident or "unstable" groups.

Three additional multiple correlations were computed:

ESP Total with Self-Confidence and Social Extraversion
ESP Total with Self-Confidence and Thinking Extraversion
ESP Total with Self-Confidence and Annoyance

They were of some interest but none of them proved better than self-confidence alone, and none approached the excellent predictive qualities of self-confidence working in conjunction with emotional stability. All multivariate analyses of this nature involve very laborious calculations, and we believe that such work would be justified only by larger researches than the preliminary one reported here.

The original design of the experiment included a search of the analyzed data for the best pair of predictive measures suitable for multiple regression analyses. Which pair of personality measures would prove to have the greatest predictive power was not and could not, of course, be foretold in advance of the experiment. All other statistical tests reported in this paper were, however, incorporated in the original design of the experiment in the form of hypotheses. We have resisted the temptation to indulge in elaborate squeezing of the data to produce "results" not foreseen in advance of the experiment.

Conclusions and Prospects

The purpose of the investigation was the purely exploratory one of searching a large field of personality in relation to the functioning of extrasensory perception. The results show not one or two correlations with ESP, but something like a handful of them. The results, so far as the measures are concerned, are verbally summarized in the following table. The descriptions apply to percipients whose ESP scores were high. Opposite (or antonymous) descriptions can be applied to relatively low-scoring subjects.

Unknown	*Known*	*Total*
Self-confident	Self-confident	Self-confident
Thinking extravert		
Happy-go-lucky (?)		
	Not depressed	Not depressed
	Not cycloid	
	Not nervous	Not nervous
	Not easily annoyed	
Emotionally stable		Emotionally stable
Calm trustful		Calm trustful

Some of the personality variables are themselves intercorrelated, and it is evident that much work remains to be done in future research to separate what may be called the independent effects of the variables from the dependent or related effects.

The results now reported draw attention to what has been repeatedly observed in personality-ESP research. That is that even though the total score is insignificant, there may be extensive evidence of ESP in operation. This leads to the conclusion that mere absence of high or low total scores does not permit the conclusion that ESP is not functioning. So far as present and past personality-ESP researches go, the evidence points to the likelihood that ESP is *always* present in such tests. Further it is most likely present in *any* ESP test, but unaided card-guessing will not reveal it. We learn by experience, yet it is a disagreeable reflection that the millions of card-calling records accumulating dust on the shelves of psychical research organizations may contain important evidence of ESP in action—if only we knew how to unravel it.

Special consideration is given here to the quality of self-confidence, which has often been noticed as a possibly crucial factor in psychical experiments. Thus Soal and Goldney's subject, Mr. B. S., possessed "unlimited confidence in his power to guess the symbols on cards." When he presented himself to the experimenter he said he "had not come to be tested, but to 'demonstrate' to us the reality of telepathy" (13). Whether B. S.'s confidence in card-guessing extended to the daily affairs of life (as with our best subjects) we do not know, but evidence from other personality-ESP researches suggests that it is a characteristic of even moderately successful percipients. Sometimes, however, the self-confidence factor is described by other names. Thus the measures known as extraversion-introversion contain a large amount of what Guilford and Martin call self-confidence. Gardner Murphy has remarked, "As measured, then, extroversion may prove to consist primarily of the *capacity to retain self-confidence* despite social onslaughts upon it . . ." (9, p. 603).

It may be recalled that in her extraversion-ESP studies (6) Humphrey found that extraverts in terms of the Bernreuter inventory did well at ESP, while the introverts gave low ESP scores. In his studies of the Bernreuter inventory, Flanagan reported that many of those questions dealing with extraversion form part of another factor which he labelled "self-confidence versus self-consciousness."

The question arises, therefore, whether the self-confidence results reported here do not in fact confirm previous findings. If that is so, then self-confidence (known by this or any other name) may form the foundation of repeatable experimentation in quantitative psychical research.

Conditions of Repeatability

If repeatability in experimentation is, as we tentatively suggest, well founded, what are the terms of successful repetition? Several suggestions can be made in addition to the use of a reliable measure of self-confidence or extraversion. The requirement to which we wish to call special attention is that short experimental sessions with few ESP runs are of little use. This point is sharply brought out when it is seen how much our results were improved by the use of a rather large number of runs in the session. The following table shows the growing magnitude of the ESP-confidence correlation after each group of four runs:

4 runs: $r = -.10$
8 runs: $r = +.22$
12 runs: $r = +.42$
16 runs: $r = +.55$

If we had restricted the sessions to four runs per subject, the correlation would have been almost nonexistent, indeed slightly negative; and even after eight runs there would have been no serious evidence of the relationship between confidence and clairvoyance. It is not until about the twelfth run that the relationship becomes clear, and at the end of the sixteenth run (with which the session closed), the correlation is highly significant. As has been noticed in other researches, the lesson appears to be that short sessions are unavailing, and that quite long sessions of, say, sixteen runs are required in work of this nature.

Similar results were reported by Humphrey in her study of ESP and introversion-extraversion. Each of the subjects in that research called twenty packs of ESP cards. Analysis showed that if they had called only four runs, no difference at all between ESP scores of introverts and extraverts would have been found. Even after ten runs for each subject the introversion-extraversion difference was not large enough to be significant.

Another possible condition of successful repetition is that the subjects should be tested singly. From previous work it appears that experiments conducted with a whole *group* of persons at one time either produce null ESP results in relation to personality measures, or the groups must be very large before any degree of significance is likely to emerge. In other words, group experimentation is less sensitive than individual experimentation.

One other point deserves special notice. It has sometimes been asserted that in this kind of research personality does not determine the *quantity* of ESP but distinguishes only between subjects who

score above and below chance expectation (10, p. 154; 11, p. 112). The results here presented do not agree with this notion. Every one of the personality variables that have attained significance in this research has been related to ESP as a *quantity*.

The premature conclusion that personality is related only to the "sign factor" (that is, plus or minus deviations in relation to chance expectation) may be due to a lack of understanding of the limitations of the methods used in most previous personality research. Most investigations have compared ESP scores of subjects divided into two groups: expansive-compressive, sheep-goat, midrange-extreme, well adjusted-poorly adjusted, secure-insecure. With only two crude classes, it is not surprising to find one group with positive ESP scores and one with negative ESP scores. If we had a *perfect* correlation between ESP and some other measure, and if we arbitrarily sliced that distribution in half, we might well expect the upper half to have high ESP scores and the lower half to have low ESP scores. More refined methods of classifying subjects (than the two-category method) reveal a relation of personality to *amount* of ESP. The present research has shown this by the use of the regression statistic with personality tests having a range of 10 or 11 scores.

Regression is the step-by-step measurement of a variable *quantity*. There are cases in the present work in which the regression is highly significant, but it would be reckless to proceed to the conclusion that any negative ("minus") deviations involved at one end of the regression are independently significant.[16] There is a more or less orderly progression from a low number of hits to a large number of hits in ESP along with increased levels of self-confidence, for instance. If we had used the crude method of a simple dichotomy, we would have observed that positive ESP scores were made by self-confident subjects and that negative ESP scores were obtained by unconfident subjects. The orderly relation of amount of ESP success and levels of confidence could not have been detected by the cruder methods.

Influence of the Experimenters

A problem which we have scarcely touched upon in the main part of this paper is a very old one—*the influence of the experimenters on the percipients*, and therefore upon the experimental results. This is a whole field of investigation in itself with which we hope to deal in later research. In the meantime some tentative evidence may be offered. It is convenient to refer again to the self-confidence matter. Here, as the accompanying graphs in Figure 6 show, striking differ-

[16] One would have to apply a special method for evaluating the "extreme deviate."

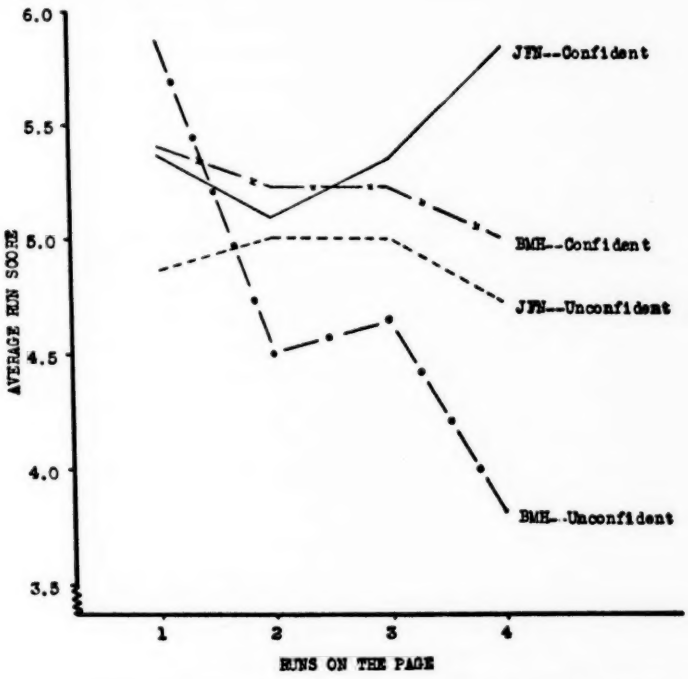

FIG. 6. The subject-experimenter relation as shown by position effects for confident and unconfident subjects. The positions are the same as those described in the legend of Figure 4. See text.

ences were found between the results obtained by the two experimenters. Dividing our subjects, as before, into confident and unconfident, we see that with BMH holding the cards when the confident subjects were calling, their scores were above the mean (except in the fourth run of the set when they were exactly at the mean). The slight decline through the set is quite insignificant and must be reckoned a chance effect. With the *same* confident subjects, and with JFN holding the cards, the scores take the form of a U-curve, which achieves its highest success in the last stage of the set. However, the curve is only questionably significant, the probability being rather greater than .05.

A similar remark applies to the score positions when JFN was holding the cards for the unconfident subjects. The inverted U-curve is pictorially attractive and statistically trivial. No such remarks apply to the case when BMH was card-holder for the same uncon-

fident subjects. They began remarkably well with the splendid average of 5.86, but their glory ended there, and their fall was as rapid as it was astonishing, ending up with an average in the last stage of 3.79 hits per run. The precipitate decline is satisfactorily represented by a straight line (the apparent slight recovery at stage 3 is negligible and statistically insignificant), with a variance ratio, F, of 15.15 and a probability of .0001, that is, a result that would occur by chance only once in 10,000 such tests.

The explanation of this decline is difficult to find. Let us contemplate the situation in the experimental room. BMH is sitting behind the screen and lifting off one card after another from the pack, never seeing their faces. The subjects under consideration are those who were afterwards found to be of the "unconfident" category. The subject of the moment can get glimpses of BMH through the tiny "window" in the screen, and it seems safe to suppose that the subject's thoughts will be in BMH's direction. On the subject's left is JFN, much closer than his colleague. He has his back turned or half-turned to the subject and his sole duty is to record the subject's spoken calls. At the end of each run JFN pushes his chair a few feet from the table to sit beside the subject and compare the calls with the target list (obtained from BMH). BMH is busy for a little, recording the calling-time from the stopwatch, putting the last used pack out of the way, and obtaining a new one from the nearby drawer for the next run. This done, she comes over and checks her colleague's count of the score. In brief, during the period (half the session) when BMH is "card-holder," the subject's direct contacts are more with JFN than with her. We believe it would be imprudent at the present time to ascribe the steep fall in scores with unconfident subjects to the influence of BMH merely because she controlled the cards. It is just as possible in our view that the influence causing the damaging effect on the unconfident subjects' scores came from JFN because of his closer association with the subjects. We do not know.

The table below gives strong support to the hypothesis that there is some interaction between card-holder and subject (or it may be between recorder and subject). In each of the six cases the average score in the column headed JFN is higher than that in the BMH column, whether subjects have the "desirable" personality qualities or the "undesirable" ones. But it will be noted that for both card-holders those with the "desirable" attributes get the better scores.

We conclude that the whole experimental situation, here as in other branches of research, is in urgent need of intense and thorough investigation.

Description of Subjects	JFN Average Score	BMH Average Score
Confident	5.41	5.21
Unconfident	4.88	4.70
Difference	.53	.51
Stable	5.38	5.10
"Unstable"	4.84	4.77
Difference	.54	.33
Not Nervous	5.46	5.00
Nervous	4.99	4.94
Difference	.47	.06

With regard to the combination of personality factors as determinants of ESP scoring levels, this should be considered as only a beginning, and all that remains to be done is to point to the advantages which we believe the method offers. The joint use of two, and even three, variables has been shown in some earlier researches, but in such cases the statistical methods have been rather crude and correspondingly inefficient. As a rule they have tended to rely on simple dichotomies. Such methods are helpful in the earliest stages of research, but, alone, they are a statistical dead-end. For the ESP side there are only two levels, above chance expectation and at or below it, and there are only two levels (roughly + and —) for the personality factor. In the actual data described in this report there were 26 ESP levels (that is, the range of observed scores) and generally 7 to 10 levels for the personality factors. The analysis of all such levels and of the network of interactions between component variables does what simple cutting of the data into two groups cannot be expected to do — that is, the refined analysis gives us information about the sort of thing that is going on between the psychic factor of the percipient (or whatever name it may be called) and the cooperative or antagonistic factors in the percipient's personality.

The virtue of the multiple regression analysis is that it isolates the various elements in the card-caller's personality as they contribute to his success or failure in ESP. Here we have used only two personality elements; more could have been applied to have obtained a more complete reconciliation with percipients' scores. Theoretically, the only limit to the number of factors is the number of subjects and the increasing statistical labor as each element of personality is added to our scheme of things and to our understanding of the problem. There is no reason why such analyses should not include personality influences arising from experimenters and agents as well.

That is *analysis*. There is also the *synthesis*. For having broken down the relations of personality to psi, we have then to reconstruct the scheme of things and find, as precisely as may be, where and how the psychic factor fits into what Dr. Mace has called "the structure of the mind." Almost needless to remark, little can be usefully said on this aspect of the matter at the present time. All that need be done is to point to it as an eventual aim. In some respects such a problem is psychological, in a considerable degree it is philosophical, but primarily it is a problem for psychical research. From the research viewpoint it begins to appear as a practical possibility that personality may be susceptible of a re-synthesis so as to include a psychic factor in its structure, and thereby to give a more faithful picture of the whole.

Practical progress must be a stage-by-stage affair, since successive advances must depend upon previous findings, and it seems prudent to observe, at the close of this paper, that the findings of psychical experiments are never quite what was bargained for. In psychical research we must always expect the unexpected.

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Summary Report to the First International Conference of Parapsychological Studies[1]

The first International Conference of Parapsychological Studies met at the University of Utrecht, Netherlands, from July 30th to August 5th, 1953. Sixty-three members, drawn from fourteen nationalities, and comprised largely of physicists, chemists, biologists, psychologists, sociologists, physicians, engineers, and mathematicians, met to consider problems which arise in the investigation of types of purported communication between individuals which are not explicable in terms of any known form of contact through the sense organs, and types of contact between individuals and their physical environments which are not explicable in terms of contemporary physics and biology-processes designated generically as psi-gamma (paranormal cognition) and psi-kappa (paranormal action upon bodies not in physical contact with the individual). Such processes are often entitled "telepathy," "clairvoyance," "psychokinesis," etc.

After preliminary sessions delimiting the field of inquiry, four working groups were established: the first dealing with quantitative experimental studies of the various classes of paranormal activity, including studies of the physical and physiological aspects of paranormal phenomena; the second with interpretation of material gathered in the practice of psychiatry; the third with qualitative and spontaneous (not experimentally controlled) phenomena; and the fourth with the psychological study of those persons who appear to display a relatively large amount of paranormal sensitivity ("special sensitives"). Fifty-seven papers were presented in all.

Attention was given to the establishment and maintenance of scientific standards, the development of appropriate experimental and quantitative methods, the devices for discovering specially sensitive individuals, and the most profitable ways in which to combine and extend the concepts and methods of the various sciences in an attempt to understand more fully the relations between the living

[1] For more than 70 years an investigation has proceeded for the purpose of discovering whether there are any mental states or faculties other than those generally accepted. This research has engaged the interest of many scientists of the highest distinction. To facilitate international consultation in this field international Congresses open to the general public were held at Copenhagen (1921), Warsaw (1923), Paris (1927), Athens (1930), and Oslo (1935). After the second World War it was obviously desirable to renew these consultations but the development of new lines of research made it advisable to proceed with a somewhat different scope. Invitations were issued for the Conference at Utrecht only to active workers. The generosity of the Parapsychology Foundation made it possible to organize the Conference on a scale that could not previously have been attempted.

organism and the environment. The various scientific groups, assisted by men working in the philosophy of science, discussed the possibility of developing a theory sufficiently comprehensive to give some sort of order to the variety of phenomena described.

While most of the problems have been investigated for many years by individual scientists and by societies for psychical research, the spread of interest among scientists has been notable in recent years; and a primary activity of the Conference, beyond the authentication of various classes of facts, was the effort to develop a scientific program to deal with all types of unknown relations between individual and environment, whether at present classifiable or not.

There was, for example, marked interest in the problems of unexplained or "unorthodox" healing (recoveries from disease transcending the present concepts of psychosomatic medicine); and a medical committee was established and empowered to take the first steps towards the organization of a Research Center for the investigation and interpretation of such phenomena.

While most of the research workers in the field of parapsychology are known to one another through the technical journals, the opportunity to meet for a week under University auspices with the financial support of the Parapsychology Foundation of New York marked an important forward step in understanding across the barriers of nationality, language, and professional specialization.

The Conference established a Secretariat and a Publication Center at the University of Utrecht, and a series of Committees charged with arranging subsequent meetings of specialized groups; e.g., the physicists and engineers among the groups to meet with other physical scientists to share the experimental problems presented at the meeting, the psychiatrists to meet with other psychiatrists, etc.

The members of the Conference included R. A. McConnell of the Biophysics Laboratory of the University of Pittsburgh; Hornell Hart, Professor of Sociology at Duke University representing Dr. Rhine's laboratory; Gardner Murphy, Director of Research at the Menninger Foundation, Topeka, Kansas; H. H. Price, Professor of Philosophy, Oxford University; Gabriel Marcel, of the Académie des Sciences Morales et Politiques; Hans Schaefer, Professor of Physiology, Heidelberg University; and S. G. Soal, Professor of Mathematics at the University of London.

GARDNER MURPHY, Chairman

Review

TOUT L'OCCULTISME DEVOILE. By Robert Tocquet. Pp. 327 with 24 illustrations. Amiot-Dumont, Paris, 1952. 999 fr.

Notwithstanding its somewhat pretentious title, this book is interesting, documented, and well worth reading. M. Tocquet, who is professor of chemistry at the École Lavoisier in Paris, and is the author of some half-dozen books on chemistry and other natural sciences, is also a member of the editorial committee of the *Institut Métapsychique International,* and published earlier a book dealing with the physical phenomena of metapsychics.

The present work is devoted for the most part to description of the great variety of tricks, some ingenious and some crude, by which fakirs, and pseudo-mediums on the stage and in the séance room, simulate the several kinds of paranormal phenomena. The book does, however, mention various instances of phenomena which the author regards as genuinely paranormal. He declares, even if perhaps a little too sweepingly, that "to be in position to detect fraud, whether in physical or psychological phenomena, it is *indispensable* that the psychical researcher be a conjurer," and this not simply in the sense of having read books of conjuring, but in the sense of being himself a practical conjurer (pp. 228-9). In a footnote, the author adds that since, even when one is warned in advance, it is nearly impossible to detect the trick of a conjurer operating in full light, it is still more difficult in the darkness of séances.

It is true, of course, that *some* forms of deception are easier in the dark, but the fact is that, for sleight of hand tricks, the conjurer needs light, so that he may direct the spectator's *visual* attention away from the action which effects the trick. One is reminded in this connection of Mulholland's erroneous statement that it has been "proved" that sounds cannot be located in the dark. The fact is that the *auditory* locating of a sound depends on the slightly different sensation it causes in the two ears, owing to the different position from which each hears the sound. Thus, what is true is only that ventriloquism, for instance, which depends on *visual* clues to deceive the spectator as to the place from which voice comes, is impracticable in the dark.

M. Tocquet's own conclusions concerning the spuriousness of some of the classical cases are not all equally convincing. Some of them appear to be little more than surmises. He pointedly remarks, however, that since paranormal phenomena—especially the physical ones —are not reproducible at will, it follows that all purportedly paranormal occurrences *that occur punctually as scheduled* are necessarily

faked (p. 18n.); as for example, the fully materialized phantoms to be seen regularly every Sunday in Paris at the séances of a group which the author tactfully designates only as "The Parisian Spiritist Group."

An intriguing hypothesis which M. Tocquet advances—and which, if correct, would make the more precarious some of his surmises as to the spuriousness of certain of the recorded phenomena—is that the simulation again and again of a given type of paranormal phenomenon by an avowed stage conjurer has sometimes, though rarely and unpredictably, resulted, much to the conjurer's own surprise, in genuinely paranormal occurrence of the phenomenon. The author mentions in support statements to this effect made by the conjurers David Devant and Dizien, and others reported to have been made by Howard Thurston, Cumberland, and even Houdini. He might have cited also the detailed account of such an experience in the career of the illusionist, The Great Roland, which the latter gave to Frederick Marion, who relates it in his book, *In My Mind's Eye,* (pp. 78-81). Roland, after having been tied in a cabinet by volunteers from the audience, always managed to free one hand, with which he wrote on a slate, rang a bell, and fired a pistol. But one day the man who tied him happened to be a sailor, who knew knots, so that Roland could not free his hand. Yet, to his great astonishment, the slate was written on, the bell rung, and the pistol fired!

M. Tocquet believes that the hypothesis this would illustrate is valid for instance in the case of the famous Eva C. He gives edifying details concerning her early trickeries in the villa Carmen of General and Mrs. Noel; but he holds there is solid evidence that, in the latter part of her career, she produced spontaneously some genuinely paranormal phenomena (pp. 16, 17).

In connection with the collecting of reports of spontaneous phenomena, the author properly reminds us that some persons, simply for the pleasure of hoaxing, will make up a story out of whole cloth, and publish it. Also that some sincere persons, moved unawares by strong desire to have their own belief accepted, will embroider on a real but normal occurrence, altering, adding to or subtracting from the account of it here and there, and thus make it seem truly paranormal (p. 60). M. Tocquet might have added that sincere but equally pious skeptics often do exactly the same thing in the case of an apparently genuine paranormal occurrence, to get their own *a priori* disbelief accepted.

An interesting and valuable feature of the book consists of the biographical sketches which occupy the last hundred pages of the book. They concern 26 more or less famous mediums, pseudo-

mediums, and fakirs; 21 of the better known conjurers; and 24 noted psychical researchers and students of hypnosis.

Much need remains, however, for full length, detailed and thoroughly documented biographies of the more celebrated mediums, that would include accounts of the investigations to which they were subjected, names and identities of the participants therein, the results thereof, etc.

C. J. DUCASSE

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Correspondence

To the Editor of the JOURNAL:

I found Dr. R. A. McConnell's comments in the April JOURNAL regarding our IBM experiments[1] both generous and stimulating. There are, however, several specific points in reference to these comments that I should like to make:

In *The Reach of the Mind* Dr. Rhine states, "More than anything else, success in securing a measurable demonstration of the capacities [of psi] depends on the presence of favorable attitudes in the subjects, and the provision of helpful test conditions" (p. 138). It would seem that nearly every major worker in the field shares this opinion as witnessed by the fact that their work has been largely designed to identify these factors.

Dr. McConnell questions our justification in writing off 15 of the 21 machine errors found in the Appendix data. We did so because these sheets were not hand-checked at first in the fashion we ourselves had prescribed. These errors were on the sheets of two subjects who had not blacked in their papers properly. These Appendix sheets were first checked by an inexperienced person, and he failed to recognize the problem. He should not have checked the sheets in the first place, but the blame for this oversight lies with me, and the procedure as outlined should not be indicted. The main data of the paper were checked by the proper personnel, and the accuracy there is indicative of that which is to be expected. As for the 1 per cent error which Dr. McConnell suggests is not uncommonly found, I should point out that an error of even this magnitude in the machine would still give perfect accuracy within the small range we use. For example, if there is a 1 per cent error in the registration by the scoring needle of say a chance score of 30, the needle would

[1] S David Kahn, "Studies in Extrasensory Perception: Experiments Utilizing an Electronic Scoring Device," *Proc.* A.S.P.R., Vol. XXV, 1952, pp. 1-48.

deviate only within a range of plus or minus .3. This would still be registered as 30, however, instead of 29 or 31. Furthermore, we empirically discovered that a 1 per cent error simply did not occur when the machine was used carefully by our methods.

If asked to justify our rather top-heavy experiments, I would say that in part they were done with the hope that those adamantine men who do not *like* the concept of a human scorer, might *like* our methods. I personally do not believe our technique can surpass the accuracy with cards offered by specific workers at Duke. But this is because I know these people, and recognize their individual dependability. Some critics do not, however, and apparently would prefer to keep it that way. Thus to them I offer an alternative which is theoretically a methodological improvement, or possibly to some a methodological necessity. One can thereby check the validity of a challenged measuring device by a second device, which is well accepted, where error is both predictable and constant, and which is, above all, independent. Certainly this concept is universal and fundamental in the purest of sciences, physics. I am not so optimistic as really to believe that the theoretical nicety of this procedure, or any other, will win the cold war parapsychology is waging for acceptance; at best it may serve as another flutter of leaflets that brings a few more stragglers to our side.

In conclusion, I should like to say that I agree with Dr. McConnell in believing that clinical insights are among the most potent tools the investigator has at his disposal. But if their function is misunderstood, and they are allowed to parade as established facts, then they can become the most treacherous. In the *Proceedings* I was only questioning whether more confidence was being placed in the critical importance of attitudes than was presently justified by the experimental work which has since been carried on to verify these original clinical insights. The more of these insights the better, but let us treat them as strangers, although always with the proper deference, until they establish their right to a permanent place in our thinking.

S DAVID KAHN

Harvard Medical School
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Book Notice

PSYCHICS AND COMMON SENSE. By William Oliver Stevens. Pp. 256. E. P. Dutton & Co., New York, 1953. $3.50.

This recently published book by a Trustee of the Society will be reviewed in the next issue of the JOURNAL. It is an Introduction to the study of psychic phenomena.

HISTORY OF THE SOCIETY

The First American Society for Psychical Research was formed in 1885, in consequence of a visit by Sir W. F. Barrett to this country, and Prof. Simon Newcomb became its President. In 1887 the Society invited a man of signal ability, Richard Hodgson, A.M., LL.D., sometime Lecturer in the University of Cambridge, to become its Executive Secretary, and he accepted.

This organization later became a branch of the English Society under the very able guidance of Dr. Hodgson until his death in 1905. The American Society for Psychical Research was then re-established with James H. Hyslop, Ph.D., formerly Professor of Logic and Ethics in Columbia University, as its Secretary and Director.

THE ENDOWMENT

The American Society for Psychical Research, Inc., was originally incorporated under the Laws of New York in 1904 under the name of American Institute for Scientific Research, for the purpose of carrying on and endowing investigation in the fields of psychical research and psychotherapeutics. It is supported by contributions from its members and a small endowment fund. The income of the Society pays only for the publications and office expenses, but does not enable the Society to carry on its scientific investigations. A much greater fund is required before this work can be carried forward with the initiative and energy which its importance deserves.

The endowment funds are dedicated strictly to the uses set forth in the deed of gift and are under control of the Board of Trustees, the character and qualifications of whom are safeguarded, as with other scientific institutions.

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